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SONNENSCHEIN NATH & ROSENTHAL LLP			SMITH, COURTNEY L	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/595,975	ISHIKAWA ET AL.
	Examiner	Art Unit
	COURTNEY SMITH	2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 April 2010.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-25 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-8 and 11-25 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 23 May 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-2, 21-22, and 24-25**, are rejected under 35 U.S.C. 102(b) as being anticipated by (**Glezer 6,588,497**).

Regarding Claim 1, Glezer discloses a gas ejector (**Fig. 6**) including at least one vibrator (**where synthetic jet module--162 includes two diaphragms 176, 177 with piezoelectric actuators**), comprising: a plurality of ejecting sections (**173, 174--Fig. 7 comprising orifices 179-Fig.'s 7-8**) adapted for ejecting air in a form of a pulsating flow (**wherein air is expelled from the orifices into a synthesized jet--Col. 13 ,lines 45-63**) such that vibration of the vibrator allows sound waves respectively generated upon ejection of the gas to weaken each other (**as set forth by Col. 11, lines 25-35--where synthetic jet actuators oscillates the diaphragms at resonance frequency thereof to cause a synthesized jet stream**); and first control unit which controls (**as constituted by a control system--Col. 4, lines 26-34 wherein the control system causes the diaphragm and/or piezoelectric actuators of the vibrator to move periodically or modulate in time-harmonic motion**) the frequency of the vibration of the vibrator.

Regarding Claim 2, Glezer discloses the gas ejector according to Claim 1, further comprising second control unit for the amplitude of the vibrator (wherein power supplied to the piezoelectric actuator for voltage constitutes amplitude control-- Col. 6, lines 37-44).

Regarding Claim 21 Glezer discloses the gas ejector according to Claim 1, wherein the respective ejecting sections include a housing including a plurality of chambers partitioned (where the ejecting section includes a housing as depicted by Fig. 7, and further includes chambers 173 and 174---Col. 13, lines 45-67--Col. 14, lines 1-6 discloses the chambers are sealed except for a series of orifices for air) by the vibrator such that the chambers adapted for ejecting the gas have substantially the same volume as each other (as depicted by Fig. 7).

Regarding Claim 22 Glezer discloses the gas ejector according to Claim 1, wherein the respective ejecting sections include a housing including a plurality of chambers partitioned (where the ejecting section includes a housing as depicted by Fig. 7, and further includes chambers 173 and 174---Col. 13, lines 45-67--Col. 14, lines 1-6 discloses the chambers are sealed except for a series of orifices for air) by the vibrator and adapted for ejecting the gas; and an actuator (where 57-Fig. 2A is located outside housing) arranged outside the housing and adapted for driving the vibrator.

Regarding Claim 24, Glezer discloses a gas ejector (**Fig. 6**) including at least one vibrator (**where synthetic jet module--162 includes two diaphragms 176, 177 with piezoelectric actuators**), comprising: a plurality of ejecting sections (**173, 174--Fig. 7**) adapted for ejecting air in a form of a pulsating flow such that vibration of the vibrator allows sound waves respectively generated upon ejection of the gas to weaken each other (**as set forth by Col. 11, lines 25-35--where synthetic jet actuators oscillates in time-harmonic motion by the diaphragms at resonance frequency thereof to cause a synthesized jet stream**); and first control means (**as constituted by a control system--Col. 4, lines 29-34 which controls vibration**) for controlling the frequency of the vibration of the vibrator.

Regarding Claim 25, the method steps are necessitated by the already disclosed structure of Glezer.

3. **Claims 11-12,** are rejected under 35 U.S.C. 103(a) as being unpatentable over (**Glezer 6,588,497**).

Regarding Claim 11 Glezer discloses the gas ejector according to Claim 1, wherein the vibrator has a surface extending substantially orthogonal to the direction of vibration thereof, and the area of the surface is in the range from 1,500 (mm²) to 70,000 (mm²). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the surface area in the range from 1,500 (mm²) to 70,000 (mm²) to achieve effective frequency of the vibrator since it has been held that where

the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 12 Glezer discloses the gas ejector according to Claim 11, wherein the area of the surface of the vibrator is greater than 2,000 (mm²). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the surface area of the vibrator is greater than 2,000 (mm²) to achieve effective frequency of the vibrator since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 3-6, 15-17, and 19,** are rejected under 35 U.S.C. 103(a) as being unpatentable over (**Glezer 6,588,497**) as applied to claim 1 above, in view of (**Ziada 5,798,465**).

Regarding Claims 3-4, Glezer discloses the gas ejector according to Claim 1, **except** explicitly disclosing wherein the vibrator has the lowest resonant frequency lower than

200 (Hz) or 150 (Hz). However, **Ziada** discloses wherein the vibrator has the lowest resonant frequency not higher than 200 (Hz) or 150 (Hz) (**as set forth by col. 10, lines 21-28--wherein 50-100Hz is lower than 150 or 200 Hz**). It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the vibrator frequency of Ziada in order to allow for enhanced damping of vibratory noise. **Note:** the ejecting sections, as claimed do not assert any particular structure and/or direction of ejected gas.

Regarding Claims 5-6, Glezer discloses the gas ejector according to Claim 1, **except** explicitly disclosing wherein the first control unit controls frequency to a value higher than 100 (Hz) or 35 (Hz). However, **Ziada** discloses wherein a first control unit controls (**Col. 9, lines 46-65; wherein frequency analyzer for sensor signals control optimization of flow oscillations of 34-35-Fig. 3 on gas flow 10**) frequency to a value higher than 100 (Hz) or 35 (Hz) (**as set forth by col. 10, lines 20-28--wherein 150 Hz is higher than 35 Hz or 100 Hz**). It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the vibrator frequencies of Ziada in order to allow for enhanced damping of vibratory noise. **Note:** the ejecting sections and/or the first control unit, as claimed do not assert any particular structure and/or direction of ejected gas.

Regarding Claims 15-16 **Glezer** discloses the gas ejector according to Claim 1, wherein a thermal resistance of the region between a heater (**as constituted by**

thermal wall 139 between heater 134-Fig. 5), to which the gas ejected from the respective ejecting sections is supplied, and gas surrounding the heater is lower than 0.7 (K/W) (**col. 1, lines 20-30---where thermal resistance is disclosed as about 0.4 (K/W), Except,** Glezer does not explicitly disclose a noise level at a position about 1 (m) away from the sound source of the sound waves is not higher than 25 (dBA) or 30 (dBA). However, Zaida teaches that it is known to damping noise by more than 30dB and additional damping at less frequencies **as set forth by col. 10, lines 10-32,** and thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the noise level at a position about 1(m) away from the sound source since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. **Note:** frequency values are not asserted by the applicant.

Regarding Claim 17 Glezer discloses the already modified the gas ejector according to Claim 16, wherein an envelope volume (**space defined within 162-Fig. 7**) containing the respective ejecting sections, **except** explicitly disclosing the envelope is lower than 250 (cm³). However, it would have been an obvious matter of design choice to modify the envelope size lower than 250 (cm³) to achieve desired pressure of the gas ejected, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Regarding Claim 19 Glezer discloses the gas ejector according to Claim 1, wherein a thermal resistance of the region between a heater (**as constituted by thermal wall 139**

between heater 134-Fig. 5), to which the gas ejected from the respective ejecting sections is supplied, and gas surrounding the heater is lower than 0.5 (K/W) (**col. 1, lines 20-30---where thermal resistance is disclosed as about 0.4 (K/W)**, wherein an envelope volume (**space defined within 162-Fig. 7**) containing the respective ejecting sections and the heater. **Except, Glezer** does not explicitly disclose a noise level at a position about 1 (m) away from the sound source of the sound waves is lower than 30 (dBA); the envelope is lower than 500 (cm³). However, **Zaida** teaches that it is known to damping noise by more than 30dB and additional damping at less frequencies **as set forth by col. 10, lines 10-32**, and thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the noise level at a position about 1(m) away from the sound source since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. It would have been an obvious matter of design choice to modify the envelope size is lower than 500 (cm³), since such a modification would have involved varying the volume within 250 (cm³) since a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). **Note:** frequency values are not asserted by the applicant.

6. **Claims 7-8,** are rejected under 35 U.S.C. 103(a) as being unpatentable over (**Glezer 6,588,497**) as applied to claim 2 above, in view of (**Ziada 5,798,465**) and further in view of (**Scher 7,282,837**).

Regarding Claim 7, Glezer discloses the already modified gas ejector according to Claim 2, wherein the vibrator has a surface extending substantially orthogonal to the direction of vibration thereof (**where Glezer discloses an orthogonal surface, as depicted by Fig.'s 8-9**). **Except, Glezer** does not explicitly disclose when the area of the surface is not greater than 70,000 (mm²), the first control unit controls the frequency to a value higher than 100 (Hz), and the second control means controls the amplitude so as to be in the range from 1 (mm) to 3 (mm). However, **Ziada** discloses wherein the vibrator has the lowest resonant frequency not higher than 100 (Hz) and the second control means controls the amplitude so as to be in the range from 1 (mm) to 3 (mm) (**as set forth by Fig.'s 4B-4D, where at frequency values over 100 Hz, amplification G is between 1 and 3mm**). It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the vibrator frequency of Ziada in order to allow for strong damping of vibratory noise. However, **Scher** discloses a vibrator has a surface extending substantially orthogonal to the direction of vibration thereof (**as depicted by 100a-Fig. 4, where 400 is orthogonal**). It would have been further obvious to one having ordinary skill in the art at the time the invention was made to provide a surface area of not more than 70,000 (mm²) to eject gas at a desired pressure, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claim 8, Glezer discloses the gas ejector according to Claim 7, **except** explicitly wherein the second control unit controls the amplitude so as to be in the range from 1.5 (mm) to 3 (mm) or 2 (mm) to 5 (mm). However, it would have been obvious to one having ordinary skill in the art at the time the invention was made for the amplitude to range from 1.5 (mm) to 3 (mm) or 2 (mm) to 5 (mm) since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

7. **Claims 13-14, 18, 20, and 23,** are rejected under 35 U.S.C. 103(a) as being unpatentable over (**Glezer 6,588,497**) as applied to claim(s) 1 or 22 above, in view of (**Scher 7,282,837**).

Regarding Claim 13 **Glezer** discloses the gas ejector according to Claim 2, wherein when the frequency driven by the first control unit (**as already set forth**), the amplitude driven by the second control unit (**as already set forth**). **Except, Glezer** does not explicitly disclose the vibrator has a surface extending substantially orthogonal to the direction of vibration thereof, and the area of the surface are respectively defined by A (Hz), B (mm), and C (mm²), the value of A x B x C is given in the range from 100,000 (mm³/s) to 10,000,000 (mm³/s). However, **Scher** discloses a vibrator has a surface extending substantially orthogonal to the direction of vibration thereof (**as depicted by 100a-Fig. 4, where 400 is orthogonal**). It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector

of Glezer with the orthogonal surface of Scher in order to allow for desired frequencies not likely to cause audible noise. It would have been further obvious to one having ordinary skill in the art at the time the invention was made to vary A, B, and C for a surface area range between 100,000 (mm³/s) to 10,000,000 (mm³/s) to optimize frequencies, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 14 Glezer discloses the gas ejector according to Claim 13, **except** explicitly wherein the value of A x B x C is smaller than 200,000 (mm³/s). However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the value of A x B x C smaller than 200,000 (mm³/s) to optimize frequencies, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claim 18 Glezer discloses the gas ejector according to Claim 1, **except**, explicitly wherein the vibrator has an approximately symmetrical shape with respect to a plane extending orthogonal to the direction of vibration thereof. However, **Scher** discloses a vibrator has a surface extending substantially orthogonal to the direction of vibration thereof (**as depicted by 100a-Fig. 4, where 400 is orthogonal**). It would have been obvious to one having ordinary skill in the art at the time that the invention

was made to provide the gas ejector of Glezer with the orthogonal surface of Scher in order to allow for desired frequencies not likely to cause audible noise.

Regarding Claim 20 Glezer discloses the gas ejector according to Claim 1, **except** explicitly wherein the vibrator includes a first vibrator having a surface extending orthogonal to the direction of vibration thereof and an asymmetrical shape with respect to the surface and a second vibrator having substantially the same shape as that of the first vibrator and arranged so as to vibrate along substantially the same direction as but in an opposite direction to that of the first vibrator. However, **Scher** discloses a vibrator includes a first vibrator having a surface (**where 400-Fig. 4 is orthogonal**) extending orthogonal to the direction of vibration thereof and an asymmetrical shape with respect to the surface (**as depicted by 100a-Fig. 4**); and a second vibrator (**as depicted by Fig. 5, where a second vibrator of the same shape is shown being opposite to and vibrating in the same direction**) having substantially the same shape as that of the first vibrator and arranged so as to vibrate along substantially the same direction as but in an opposite direction to that of the first vibrator. It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the respective vibrators configurations of Scher in order to allow sufficient cooling of a desired area at frequencies not likely to cause audible noise.

Regarding Claim 23 Glezer discloses the gas ejector according to Claim 22, wherein the housing has a bore section (**as further depicted by Fig. 8**) extending from the

outside thereof to at least one of the chambers, the gas ejector further comprising.

Except, Glezer does not explicitly disclose a rod extending through the bore section and fixed to the vibrator so as to move integrally with the actuator, and a supporting member provided in the bore section so as to support the rod. **However, Scher** discloses a rod (**802-Fig. 9**) extending through the bore section (**Col. 8, lines 1-5**) and fixed to the vibrator (**Col. 8, lines 28-30**) so as to move integrally with the actuator (**as depicted by Fig. 9**), and a supporting member provided in the bore section so as to support the rod (**as depicted by Fig. 9**). It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the rod configuration of Scher in order to allow for directional airflow and thus a more improved cooling.

Allowable Subject Matter

8. **Claims 9-10**, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. **Regarding Claim 9;** wherein the vibrator has a surface extending substantially orthogonal to the direction of vibration thereof, and, when the area of the surface is not greater than 70,000 (mm²), the first control unit controls the frequency so as not to be higher than 35 (Hz), and the second control unit controls the amplitude so as to be in the range from 1 (mm) to 5 (mm).

Response to Arguments

9. Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection. Regarding Claim(s) 1-23; new rejections are made using the prior art from the previous rejection to address the amended claim(s). Regarding Claim(s) 24-25; the applicant argues that Glezer does not fairly suggests 'a plurality of ejecting sections adapted for ejecting air in a form of a pulsating flow such that vibration of the vibrator allows sound waves respectively generated upon ejection of the gas to weaken each other'. The Examiner respectfully disagrees. It is to be noted that Col.11, lines 25-35 sets forth diaphragms of synthetic jet actuators oscillate in time harmonic motion through the vibration of piezoelectric elements on the diaphragms at a resonance frequency of the diaphragms and the jet stream is synthesized, and thus the control system-Col. 4, lines 26-28 which constitutes the first control unit causing the diaphragms of the respective jet actuators to move periodically or modulate in time harmonic motion will allow for the respective sound waves to weaken each other. The Examiner hereby notes that the claim does not assert how the ejectors are positioned in relation to each other, the respective amplitude and frequency ranges or any other structure or wave characteristics that distinguishes the claim over the prior art. The Examiner further notes that the applicant cannot distinguish the claim from the prior art solely based on the assertion that the ejecting sections are 'adapted' to eject air such that the vibration of a vibrator allows sound waves generated upon ejection of the gas to weaken each other; whereas it has been held that the recitation that an element is "adapted for/capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138. Finally, in likeness to the applicant's gas ejecting adaptation, Glezer discloses orifices of the ejecting sections

adapted to eject gas in the form of a pulsating flow and respective sound waves generated thereof to weaken each other by virtue of the structural position of ejecting sections as well as the control system that controls the resonant frequency of the respective vibrators to move periodically or modulate in time harmonic motion to cause the synthesized jet stream.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COURTNEY SMITH whose telephone number is (571)272-9094. The examiner can normally be reached on M-F 7:30 am-5 pm (1st Fri. off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash Gandhi can be reached on 571-272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. S./
Examiner, Art Unit 2835

/Jayprakash N Gandhi/
Supervisory Patent Examiner, Art Unit 2835